

deauratella: signum of complex shape (Dr Gazmany suggests "Like a contorted and twisted leaf"), with one end drawn out more or less into a spine, and perhaps with other smaller spines; it is difficult to describe as it rests in a different position in virtually every mount.

For those collectors who feel unable to mount the genitalia of their specimens, where necessary I would carry out the preparations and determinations myself rather than risk losing valuable data.

I must acknowledge gratefully the helpful advice I have received from Dr. Gozmany on this matter. Thanks are also due to Mr Wakely for the loan of specimens.

69 Weighton Road, Harrow Weald, Middx. 1.9.66.

Butterflies in the French Massif Central, July 1966

By R. F. BRETHERTON, C.B., M.A., F.R.E.S.

The Massif Central is a part of France which is relatively little known to English visitors, and particularly to lepidopterists. H. Rowland-Brown and R. M. Prideaux collected there a little before the first war, and some others have been there later, but there have been few published accounts. French lepidopterists also left the exploration of the more out of the way parts of the area until very late: even among the butterflies some of the most interesting species have only been noticed in the last thirty years, including such "relic species" as *Erebia ottomana* H-S, *E. sudetica* Stdgr., *Boloria sifanica* Gr.-Gr. (*aquilonaris* Stichel), *Clossiana titania* Bdv.

In form, the Massif Central is a great egg-shaped plateau over 200 miles long and 150 miles broad with a general height of about 700/1000 metres. This, has, however, been eroded into very deep valleys, often taking the form of gorges, while on the other hand it is capped by a number of higher mountainous blocks whose summits reach between 1400 and 1900 metres. There is much geological diversity: in the north and east, basalt rocks which are the remains of extinct volcanic cores, now rounded and (in early July) brilliant with sub-alpine flowers; in the centre, great areas of granite moorland reminiscent of Cornwall or Devon; in the south, the limestone "Causses" deeply-cut into by the gorges of the Tarn and the Lot. The eastern escarpment, above the Rhone Valley, is steep and little broken, and this has kept the influence of the Mediterranean fauna to a minimum except in the extreme south, where the plateau looks out over the narrow plain which separates it from the sea and the Pyrenees.

Obviously one cannot make a serious study of an area of this size in a fortnight, even with a car. My wife and I therefore chose a route which would take us through some of the parts which were scenically and archaeologically most interesting and would also make it possible to find a number of the species or sub-species of butterflies which are special to the area, and to get a general impression of its resources.

We crossed to France by the car-ferry from Newhaven to Dieppe on the evening of 30th June and, after spending two nights at Blois in order to visit some of the Loire chateaux, we reached the Monts Dore late on 3rd July. The town of Mont Dore was seething with people and traffic, so

we drove on by the exciting road over the mountains by the Col de la Croix Morand (1400m.) and found ourselves rather humble but adequate accommodation at the Hotel de la Poste in the village of Chambon on its further side. The next morning, which was brilliant and hot, we decided to collect up the road to the pass which we had traversed the evening before, having been greatly attracted by the richness of the forest and of the sub-alpine pastures above it. At our first stopping place another net was almost immediately sighted. This proved to belong to a local lepidopterist from Mont Dore, Monsieur Ph. Planeix. He told us that the season here was unusually early, and that we should therefore be lucky to see *Parnassius mnemosyne* L., which both he and I spent some time looking for among the crowds of *Aporia crataegi* L., mostly worn, which was the dominant species in this particular place. There were also plenty of common Fritillaries and Satyrids, and I caught a good Skipper, *Reverdinus alchymillae* Hb., and missed an enormous *Limenitis populi* L. which flew fast down the road. On M. Planeix's advice we then moved to the upper edge of the forest, and there I did get a fine female *P. mnemosyne* and saw several *Parnassius apollo arvernensis* Eisner, as well as many *Heodes virgaureae* L. Higher still, in the flowery meadows below the pass, *Erebia meolans stygne* Ochs. and *E. epiphron mackeri* Fuchs were common, and there were a few *E. oeme pacula* Frhst.; *Callophrys rubi* L. was still fresh, and *Eumedonia chiron* Rott. was local among *Geranium*; but, in spite of the grand show of Yellow Gentian in flower, I failed to find any *Maculineaalcon rebeli* Hirschke. Later in the day, after we had returned to Chambon, I had the unusual experience of catching a Clearwing, apparently *Aegeria sphaeciformis* Schiff., with a pill-box, which was the only equipment available as I was towelling myself after a quick bathe in the lake!

We had intended to spend the morning of the next day, 5th July, exploring the high valley of Chaudefour, and the Col Robert behind the Puy de Sancy, before moving some forty miles southwards to le Lioran in the Monts de Cantal. But, alas! there was a thunderstorm in the night and when we reached the high ground it was so deeply enveloped in mist and rain that any stay there would have been pointless. So we drove on at once via the attractive little town of Besse-en-Chandesse and Murat to le Lioran, which we reached at lunch-time. But here, too, we were greeted by a thunderstorm. A clearance in the afternoon enabled us to reconnoitre the ground in the forest where I had been told by Mr. Colin Wyatt to look for the very local *Erebia sudetica*, but more rain soon drove us back to our hotel. It rained all night and was still pouring relentlessly when we looked out next morning; so we decided to write off *E. sudetica* for the time being and look for a drier part of the country. The weather gradually improved as we drove south-east through St Flour and the interesting little walled town of Marvejols, and by the time we had crossed the river Lot and reached the limestone country of the Causse de Sauveterre in the early afternoon, it had become sunny and hot.

The Causses, though famous for their lepidoptera, are not easy to work without prior knowledge. They consist largely of vast areas of poor and often heavily pastured grassland with scattered and stunted pine trees. The butterfly population is thinly spread, and one has to find favoured spots where there are plenty of flowers to attract them from the country

round. One such spot we found that afternoon, a small hay field beside the secondary road from la Canourgue to la Malène. There in less than an hour I saw about two dozen species, including *P. apollo lozerae* Obth. (a large and very dusky female), *Melitaea phoebe* Schiff, *Brenthis daphne* Schiff and six other Fritillaries, *Hipparchia semele* L. and *H. alcyone* D. & S. and, as everywhere on the Causses, innumerable *Agapetes galatea* L. About ten per cent. of the females of the last were of the striking f. *leucomelas* Esp. without black markings on the underside hindwings.

At la Malène we descended into the magnificent gorge of the Tarn and made our way down to Le Rozier. We spent five nights, 6th to 10th July, here, at the excellent hotel which stands above the clear, green water of the river and looks across to the multi-coloured rocks which rise above it and form the edge of the Causses Méjean. A delightful spot in itself, it is an excellent base from which to explore both the Causses themselves and the Mont Aigoual area at the south end of the Cévennes, as well as the gorges of the Jonte, which flows into the Tarn between the twin villages of Le Rozier and Peyreleau. We wished we had five weeks to spend there instead of only five nights.

On our first day, after looking at the hill-top medieval village of Peyreleau, we drove up the steep road south of it into the Causse Noir, so called because the western part of it is fairly heavily wooded with dark pines. After some casting about, we found a spot where large patches of thyme in a grassy area interspersed with pine trees were attracting large numbers of butterflies. Among the Blues *Lysandra escheri* Hb., in a very fine form, was abundant and fresh in both sexes, accompanied by *L. dorylas* Schiff., *L. bellargus* Rott. (worn), and *Aricia agestis* Schiff.; the Hairstreaks *Strymon ilicis* Esp. and *S. spini* Schiff. were also common. I picked out of the swarms of *A. galatea* a single good female of *A. russiae cleanthe* Bdv.: this was the only one which we saw here or elsewhere, despite much searching for it in the barer and stonier places which it is said to prefer. Perhaps we were too late for it. Later in the day we worked across to the eastern side of the Causse Noir, south of Lanuejols, in the Gard department, where a piece of open woodland was even richer in species, including a single worn example of *Brenthis hecate* Schiff., which we also did not find elsewhere, and some *Hyponephele lycaon* Kuhns. We returned to Le Rozier in the late afternoon via Meyrueis and the gorges of the Jonte, where a stop by the wayside yielded some nice *Maculinea arion*.

We spent the next day, which was very hot, in driving up the Tarn gorges as far as Sainte Enimie and then exploring the Causse Méjean between it and Florac. This is much barer than the Causse Noir and it was unprofitable entomologically. We found no trace of our main quarry, *A. russiae* and *Agrodiaetus dolus* Hb., and saw no new species except *Coenonympha iphis* Schiff.; so we consoled ourselves late in the afternoon by visiting the enormous cave of Aven Armand beneath the surface of the Causse. Despite its rather commercialised approach, involving a ride in a small electric train, it is a most impressive place, larger than a cathedral and containing a great array of multi-coloured stalagmites rising to great heights towards the roof.

On 9th July we made an expedition to Mont Aigoual (1567m.), one of the higher summits of the Cévennes. Except for its summit ridge, the mountain has been almost completely afforested during the last seventy years. Apart from one spot, above the exit of an underground river at

Bramabiau, where there were large colonies of *Limenitis anonyma* Lewin (*rivularis* Stichel) and *Melitaea diamina* Lang, we did not see many butterflies in the forest area. But on the barer ground near the top there was quite an interesting assemblage, including a lot of presumably migratory *Colias croceus* Fourc., *Vanessa atalanta* L. and *V. cardui* L., *Erebia epiphron* and *E. meolans*, *Heodes virgaureae*, *Palaeochrysophanus hippothoë* L., *Pyrgus carthami* Hb. and *P. alveus* Hb.

The *E. meolans* on Mont Aigoual, and also those which we saw later in the Monts Tanargue, differ greatly from those we had found in the north on the Monts Dore. In the latter the fulvous markings are bright orange-red and are very extensive, forming continuous bands on both fore- and hind-wings. Though usually referred to ssp. *stygne* Ochs., they seem to me closest to ssp. *posidonia* Frhst. from the Vosges and the Black Forest. In the Mont Aigoual examples the markings are a dull red-brown, and are narrower and more broken up by the ground colour: on the hindwings they are reduced to mere spots. They agree closely with a series which I took on the Ailefroide, in the Dauphiny Alps, and are apparently referable to f. *calaritas* Frhst. Our captures on the Col de Meyrand in the Tanargue are similarly marked, but are a little less dark and noticeably smaller. A pair caught by the roadside in the Monts d'Aubrac, in the west of the Massif Central, are intermediate in markings but very large. But there is some individual variation in all places, *E. meolans* is very widely spread in the Massif above about 1000m., and it seems likely that two sub-species of different origins have now become more or less blended. There is parallel variation in *E. epiphron*. The ssp. *mackeri* Fuchs on the Monts Dore and Cantal are bright and strongly marked, while those on Mont Aigoual are dull and usually have the black spots reduced to mere points, even in the females. De Lesse has named this race *cebennica*, and has pointed out that it is closer to the East Pyrenean than to the Alpine forms of the species. Here, again, however, my specimens show very wide individual variation.

The next morning we walked up the steep path from Le Rozier to the high rock of Capluc, which juts out from the edge of the Causse Méjean over the Tarn gorge. The ground was swarming with insects, and among the more interesting were many fresh examples of both sexes of *Meleageria daphnis* Schiff., a few *Laeosopis robotis* Esp., and worn *Pyronia bathseba* F. (*pasiphae* Esp.) flying with newly emerged *P. tithonus* L. There were also many Burnets, including *Zygaena erythrus* Hb., *Z. occitanica*, Vill., *Z. transalpina* Esp. and *Z. ephialtes* L., in much greater numbers than we had previously seen them on the Causses. Just below the rock, large larvae of *Papilio machaon* L. were feeding on a patch of fennel while a fresh female was laying eggs on the same plants. In the afternoon we returned to the Causse Noir behind Peyreleau, and a short walk along the escarpment above the Jonte yielded three fine males of *Agrodiaetus dotus* Hb., which was probably just emerging. In appearance they seem to be identical with the form found on the Mont Pacanaglia above Nice, though they have been given sub-specific rank as *vittata* Obth.

We left Le Rozier the next morning, 11th July, in doubtful weather, for an eighty mile drive north east to La Bastide, near the source of the Allier, where we intended to spend two nights. A thunderstorm which broke on us at Sainte Enimie spoiled our hope of further collecting in the

Causse de Sauveterre, so we pressed on through Mende, where there is a fine cathedral and a mediaeval bridge over the Lot, into the granite mountains of the Margeride. The weather had improved slowly, so it seemed worth while to turn aside about 3 p.m. to explore a marsh above Les Salesses, at about 1,300 m. This I knew from the literature was a habitat of the cranberry-feeding Fritillary, *Boloria sifanica* Gr.-Gr. (*aquilonaris* Stichel), which I particularly wanted to see. A shallow valley in a piece of bleak moorland and rough pasture, it did not look a promising locality, but it proved to be a veritable gold mine for Fritillaries. Besides *B. sifanica* we found *Melitaea athalia* Rott., *M. parthenoides* Kef., *M. diamina* Lang., *Clossiana euphrosyne* L., *C. selene* Schiff., *C. titania* Hb. (*amathusia* Esp.), *Brenthis ino* Rott., *Fabriciana niobe* L., and *Mesacidalia charlotta* Haw., all ten species flying in the marsh itself or among the scattered pines on the slope alongside it. They were, indeed, the dominant element in the butterfly population: few other species were present, though these included a few *Erebia epiphron*, *E. oeme*, and *Maculinea alcon*, and many small *Zygaena trifolii* Esp. We noticed that *B. sifanica* was much more choosy than the other species about its flight times: on our first visit, that afternoon, it would only move in bright sunshine, of which there was little, and when we came again at 10 a.m. two days later we saw none in the first half hour despite full sunshine, though they flew plentifully a little later as the temperature rose. The beautiful *C. titania* was very common, sitting especially on the marsh thistles.

La Bastide seemed to us a rather bleak village, now being developed for winter sports and summer holiday camps. I would not recommend it except for its convenient position at the intersection of north-south and east-west roads. We used it as a base for an expedition the next day into the Tanargue mountains, to the east. After driving through fine forests on a beautiful but very winding road through Saint Laurent-les-Bains, we emerged on the Col de Meyrand (1,371 m.) in brilliant weather. The short, tufted grass beside the road was alive with *Erebias*: to my great pleasure, most of these were *Erebia ottomana tardenota* Pravi, both sexes being in fine condition. This is a much larger and more beautifully marked insect than the others of the "tyndarus" group, and it is surprising that its presence in these parts of the Massif Central was not recognised until about 1940. The only other locality known for the species west of the Balkans is on Monte Baldo, above Lake Garda in north Italy. With it were a number of *E. meolans*, but *E. epiphron*, which we saw at similar altitudes elsewhere in the Massif Central, was absent—perhaps displaced by *E. ottomana*. From the Col we walked a mile or so east through open forest to a rather higher out-jutting peak, where also *E. ottomana* was common; and it extended some distance down the road on the north side of the Col, where we spent the early afternoon in the forest. Here we again saw *C. titania* and *B. ino* among great numbers of commoner butterflies. We returned to La Bastide by the easier northern road through St Étienne de Lugdaries, where we were amused to see that the hay, which had been cut mechanically in a most modern manner, was nevertheless removed in most primitive carts drawn by two cows. This was, indeed, rather characteristic of the transitional state of agriculture in many parts of the Massif Central.

Our holiday was now approaching its end. I decided to have another try for *E. sudetica* at Le Lioran on our way north. Accordingly, after

spending part of the morning of 13th July in a second visit to the marsh at Les Salesses, we took a cross-country route on secondary roads over the high granite plateau of the Margeride to Rieutort and thence on via St Chély and Chaudesaigues to the south side of the Lioran road tunnel, where we spent the night at a very simple but delightful little hotel called la Chazade. On the way there were several promising-looking places, but I was suffering from the effects of a bee-sting below the eye and did no serious collecting after Les Salesses. The next morning, however, I was sufficiently recovered to deal very faithfully with *E. sudetica*. After finding a small colony in the forest above the tunnel, we came on it flying in abundance in the large flowery meadow which we had reconnoitred nine days earlier in the rain. Males were mostly fresh and females just emerging, and in very little time I had a good series. *E. sudetica lioranus* de Lesse is a little larger and decidedly more brightly marked than any race of *E. melampus*, from which Warren separated it in 1949; and the distinctive additional black point at the top of the fulvous band on the upperside is present in all my examples, which, indeed show very little variation. It was the dominant insect on this ground, being accompanied by only a few *E. epiphron* and some very fine *E. euryale* which appear to belong to ssp. *isarica* Heyne, and by the Coppers, *H. virgaureae* and *P. hippothoe*. Though the meadow was golden with blossoms of *Gentiana lutea*, I failed to find any *M. alcon*. We noticed sadly that part of the meadow was already being devastated by the construction of a cable railway to the top of the Plomb de Cantal, and we feared that trampling by the populace would soon complete its ruin.

We descended to the road on the north side of the tunnel and rejoined our car by walking through it: a somewhat eerie experience, as it is nearly a mile long and lit only by the glimmer from both ends and by the headlights of passing cars. After eating our sandwiches we headed towards Murat but turned off short of it up a side road which climbs up a long semi-alpine valley to Col d'Eylac (1,500 m.), just below the dominating summit of the Puy Mary (1,787 m.). The upper part of this valley was a mass of flowers and looked an excellent collecting ground. But unfortunately the sky had become overcast, and most of the obvious stopping places were full of picnickers, this being 14th July, a national holiday; and our timetable would not permit a longer stay in the district. So, after a short stop on the Col itself, we headed west and north through Salers and Mauriac and, by the time we stopped for the night at the little tapestry-making town of Felletin, had left the mountains of the Massif Central well behind us.

The weather during the next two days was mostly dull, and we did no collecting on the way home. We stopped to see the château of Chenonceaux, which is romantically built out over the waters of the River Cher, and after crossing the Loire at Amboise, we spent our last night at Château Renault. Thence it was an easy drive to Dieppe, whence we caught the evening car-ferry to Newhaven, and so came home just before midnight on 16th July. It has been an admirable expedition. With the help of detailed information most kindly given to me by Mr Colin Wyatt and Dr. Cleu, and some study of the literature, I had been able to see about ninety species, including most of the special butterflies of the Massif Central, as well to enjoy the other attractions of one of the most beautiful parts of France.

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Bramley, Surrey. August 1966.

The Green, the Grey and the Brown

By B. F. SKINNER and R. G. CHATELAIN

We left London for Ireland on the evening of August 11 and reached the Oxford ring road some two hours later, where we spent the remainder of the night removing a jammed thermostat and replacing a cylinder-head gasket. *Apamea secalis* L. came to the street light under which we were working but was not welcomed. We were fortunate in being able to slide the mini on to a later ferry and arrived at our destination at 1 a.m. on August 12, after an otherwise uneventful journey.

During the eight days we spent in the Burren, we stayed at Hylands in Ballyvaughan and were extremely well looked after. Ample meals were served whenever we wanted them and the draught Guinness was out of this world, the flavour being improved by the thought that it only cost 2s. a pint.

Our quarry was, of course, *Calamia tridens* Hufn., and Mr. R. F. Haynes, who had been staying in the hotel for some days, was able to tell us that the moth was out. Although by no means common, we were each able to obtain a series, but we were in some doubts whether we should be able to do so until Mr. R. P. Demuth, who was staying with his family at Ballynalackan, told us of a hot spot for the species. Although the moth came to light, the majority were not worth keeping, and we found it necessary to search the limestone, preferably after midnight, for newly-emerged specimens. Even some of these were not perfect, as any rain during emergence marked the delicate green of the forewings.

Our second objective was *Hadena caesia* Schiff. By exhaustive and exhausting searching of the rocky coastline, we were able to find some eighteen larvae, mostly between half and full size, but unfortunately much of the *Silene maritima* had been torn up and much more was inaccessible. We could, no doubt, have obtained small larvae by collecting the seed-heads but it seemed pointless to do so in view of the difficulty of rearing them.